

GOVT. POLYTECHNIC MAYURBHANJ , TIKARPADA

ACADEMIC SESSION: 2025-26 LESSON PLAN

| Discipline : MECHANICAL ENGG. | | Semester: 4th Sem | Name of the Teaching Faculty :SASMITA SAHA |
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| Subject : THERMAL ENGINEERING-II TH_2 , Course Code: MEPC204 | | No. of Days / per week class allotted : 03 | Semester From date : 22/12/2025 To Date : 18/04/2026 |
| MONTH | Week | Day | Topics |
| DECEMBER | | 1st | Gas Turbines: Air-standard Brayton cycle; Description with p-v and T-S diagrams and working. |
| | 4TH | 5th | Gas turbines Classification: open cycle gas turbines and closed cycle gas turbines |
| | 5TH | 1st | comparison of gas turbine with reciprocating I.C. engines and steam turbines. |
| JANUARY | 1st | 4th | Applications and limitations of gas turbines; General lay-out of Open cycle constant pressure gas turbine; P-V and T-S diagrams |
| | | 5th | Working and general lay-out of Closed cycle gas turbine; P-V and T-S diagrams |
| | 2nd | 1st | Jet Propulsion: Principle of jet propulsion; Applications of rocket propulsion; |
| | | 4th | Fuels used for jet propulsion; Applications of jet propulsion; |
| | | 5th | Working of a turbojet engine; Principle of Ram effect; |
| | 3rd | 1st | Working of a Ram jet engine; Principle of Rocket propulsion; |
| | | 4th | Working principle of a rocket engine; Comparison of jet and rocket propulsions. |
| | | 5th | Properties of Steam: Formation of steam under constant pressure; , , , |
| | 4th | 1st | Industrial uses of steam; Basic definitions: saturated liquid line, saturated vapor line, liquid region, vapor region, wet region |
| | | 4th | Basic definitions of superheat region, critical point, saturated liquid, saturated vapor, saturation temperature, |
| | | 5th | Basic definitions of sensible heat, latent heat, wet steam, dryness fraction, wetness fraction, saturated steam, superheated steam, degree of superheat ,Determination of enthalpy, internal energy |

FEBRYARY


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| | | 4th | Determination of internal latent heat, entropy of wet, dry and superheated steam at a given pressure using steam tables |
| | 5th | 5th | Mollier chart for the following processes: Isochoric process, Simple direct problems on the above using tables and charts; |
| | | 1st | Isobaric process, Simple direct problems on using tables and charts; |
| | | 4th | Hyperbolic process, Isothermal process, Simple direct problems on the using tables and charts; |
| | 1st | 5th | Isentropic process, Throttling process, Polytropic process; Simple direct problems on the using tables and charts; |
| | | 1st | Steam calorimeters: Separating, throttling |
| | | 2nd | Combined Separating and throttling calorimeters – problems. Revisions |
| | | 4th | Steam Generators: Function and use of steam boilers; Classification of steam boilers with examples; |
| | 2nd | 5th | Brief explanation with line sketches of Cochran boiler Brief explanation with line sketches of Babcock and Wilcox Boilers, Comparison of water tube and fire tube boilers; |
| | | 1st | Description with line sketches and working of modern high pressure boilers Lamont and Benson boilers; |
| | | 4th | Boiler mountings: Pressure gauge, water level indicator, fusible plug, blow down cock, stop valve, safety valve, (dead weight type, spring loaded type, high pressure and low water safety alarm); |
| | 3rd | 5th | INTERNAL ASSESSMENT-I |
| | | 1st | Boiler accessories: feed pump, economizer, super heater and air preheater Study of steam traps & separators; |
| | | 4th | Explanation of the terms: Actual evaporation, equivalent evaporation, factor of evaporation, boiler horse power and boiler efficiency; |
| | 4th | 5th | Formula for the above terms without proof; Simple direct problems on the above; Draught systems (Natural, forced & induced). |
| | | 1st | Steam Nozzles: Flow of steam through nozzle |
| | | 4th | Velocity of steam at the exit of nozzle in terms of heat drop using analytical method |
| | 1st | 5th | Velocity of steam at the exit of nozzle in terms of heat drop using Mollier chart |


MARCH

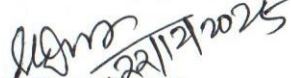
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| 2nd | 1st | Discharge of steam through nozzles; Critical pressure ratio; | |
| | 4th | Methods of calculation of cross-sectional areas at throat and exit for maximum discharge; | |
| | 5th | Simple numerical problems. | |
| | 3rd | 1st | Effect of friction in nozzles Super saturated flow in nozzles; |
| | | 4th | and Working steam jet injector; |
| | | 5th | Simple numerical problems. |
| 4th | 1st | Steam Turbines: Classification of steam turbines with examples; Difference between impulse & reaction turbines, Principle of working of a simple De-level turbine with line diagrams- Velocity diagrams | |
| | 4th | INTERNAL ASSESSMENT-II | |
| 5th | 1st | Expression for work done, axial thrust, tangential thrust, blade and diagram efficiency, stage efficiency, nozzle efficiency; | |

APRIL

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| 1st | 4th | Methods of reducing rotor speed; compounding for velocity, for pressure or both pressure and velocity |
| | 5th | Working principle with line diagram of a Parson's Reaction turbine-velocity diagrams |
| | 1st | Simple problems on single stage impulse turbines (without blade friction) |
| 2nd | 4th | Simple problems on single stage reaction turbine including data on blade height. Bleeding, re-heating and re-heating factors (Problems omitted) |
| | 5th | Governing of steam turbines: Throttle, By-pass & Nozzle control governing. |
| | 1st | Governing of steam turbines: By-pass & Nozzle control governing. |
| 3rd | 4th | Revision |
| | 5th | Previous year question discussions |


 Subject Expert
 G.P Mayurbhanj
 20/12/2025


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